



A Dutch field survey on fungal infection and mycotoxin concentrations in maize

Author(s): Van Asselt ED, Azambuja W, Moretti A, Kastelein P, De Rijk TC, Stratakou I, Van Der Fels-Klerx HJ
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Abstract:

Mycotoxins are secondary metabolites produced by fungi that can cause adverse health effects. Due to climate change, temperatures are expected to rise and changes in rainfall patterns are foreseen. These developments may increase fungal occurrence and mycotoxin concentrations in maize. It is therefore useful to monitor mycotoxin levels in maize and record the accompanying agronomic factors and weather parameters. This paper describes a field survey in the Netherlands in which information on soil, cultivar, green manure, tillage as well as sowing, emergence, flowering and harvest dates of silage maize were collected from 148 growers. A small number of these growers (42 in total) were visited to collect maize samples revealing that 50% of the samples were contaminated with *Fusarium* species and mycotoxins were detected in 25% of the samples. The *Fusarium* species that was most commonly found was *F. crookwellense* followed by *F. graminearum*, *F. culmorum*, *F. sporotrichioides* and *F. equiseti*. In total 31 mycotoxins were analysed. The predominant mycotoxins present were (sum of 3 and 15)-acetyl-DON and nivalenol; other mycotoxins found were alternariol, beauvericin, deoxynivalenol, diacetoxyscirpenol, moniliformin and zearalenone. Nivalenol was present in concentrations up to 1670 microg kg⁻¹ and acetylated DON was usually present at higher concentrations than DON. Statistical analysis of the current data showed no correlation between mycotoxins present and agronomic factors recorded. Field studies as described in this paper are useful and need to be continued in the future in order to observe trends in mycotoxin occurrence.

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Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Food/Water Quality

Food/Water Quality: Biotoxin/Algal Bloom

Geographic Feature:

resource focuses on specific type of geography

Climate Change and Human Health Literature Portal

None or Unspecified

Geographic Location:

resource focuses on specific location

Non-United States

Non-United States: Europe

European Region/Country: European Country

Other European Country : Netherlands

Health Impact:

specification of health effect or disease related to climate change exposure

Cancer, Other Health Impact

Other Health Impact: mycotoxins

Resource Type:

format or standard characteristic of resource

Research Article

Timescale:

time period studied

Time Scale Unspecified